

**WHAT IS CLAIMED IS:**

1. A variable diameter sprocket comprising:
  - a support having a rotation axis and at least three slotted and radial track elements each provided with at least two stopping elements;
  - at least three sprocket portions, each being so mounted to a respective one of said at least three radial track elements of said support as to be radially movable therein; each of said at least three sprocket portions includes a movable element configured and sized to interconnect with said at least two stopping elements to selectively maintain the sprocket portion in a desired radial position; each sprocket portion also includes a biasing element mounted thereto to bias said movable element towards said at least two stopping elements;
  - a sprocket diameter changing mechanism including a fixed portion and a movable portion mounted to said fixed portion; said movable portion including a pushing surface so positioned and configured as to overcome a biasing action of said biasing element through a pushing action on said movable element of said sprocket portion; said pushing action causing the disengagement of said movable element from one of said stopping element; said movable portion including at least one guiding surface configured and sized to reposition said sprocket portion in a second desired radial position; said movable portion also including a throat so configured, positioned and sized as to cease the pushing action of the pushing surface when said sprocket portion has reached said second desired radial position so as to engage said movable element with a stopping element corresponding to the second desired radial position.
2. A variable diameter sprocket as recited in claim 1, wherein said at least three slotted and radial track elements are removably mounted to said support.
3. A variable diameter sprocket as recited in claim 2, wherein said at least two stopping elements are generally frusto-conical indentations.

4. A variable diameter sprocket as recited in claim 1, wherein said movable element of each said sprocket portion includes a pin slidably mounted in an aperture of said sprocket portion; said pin including a first free end so configured and sized as to contact said pushing surface and a second end so configured and sized as to cooperate with said biasing element and with said stopping elements; said pin being slidable in said aperture between a fully extended position where said second end cooperates with said stopping elements to maintain said sprocket portion in a desired position and a fully retracted position where said sprocket portion is free to radially move within said track element.

5. A variable diameter sprocket as recited in claim 4, wherein said aperture includes a peripheral projection so configured and sized as to selectively contact said guiding surface of said movable portion of said sprocket diameter changing mechanism.

6. A variable diameter sprocket as recited in claim 4, wherein said biasing element includes a compression spring biasing said pin towards said fully extended position.

7. A variable diameter sprocket as recited in claim 1, wherein said pushing surface includes four angled ramp portions generally defining an X-shaped pattern and wherein said throat is generally located in the intersection of said four ramp portions.

8. A variable diameter sprocket as recited in claim 7, wherein each of said four ramp portions includes a shoulder defining said guiding portion.

9. A variable diameter sprocket comprising:  
a support having a rotation axis and at least three slotted and radial track elements each provided with at least two stopping elements;  
at least three sprocket portions, each being so mounted to a respective one of said at least three radial track elements of said support as to be radially movable therein; each of said at least three sprocket portions includes a movable element configured and sized to selectively interconnect with said at least

two stopping elements to selectively maintain the sprocket portion in a desired radial position;

a sprocket diameter changing mechanism including a fixed portion and a movable portion mounted to said fixed portion; said movable portion including a pushing surface so positioned and configured as to disconnect said movable element of said sprocket portion from one of said at least two stopping elements; said movable portion including at least one guiding surface configured and sized to reposition said sprocket portion in a second desired radial position; said movable portion also including a throat so configured, positioned and sized as to cease the pushing action of the pushing surface when said sprocket portion has reached said second desired radial position so as to engage said movable element with a stopping element corresponding to the second desired radial position; said throat being so configured and sized that it does not contact said sprocket portion.

10. A variable diameter sprocket as recited in claim 9, wherein said at least three slotted and radial track elements are removably mounted to said support and wherein said at least two stopping elements are generally frusto-conical indentations.

11. A variable diameter sprocket as recited in claim 10, wherein said movable element of each said sprocket portion includes a pin slidably mounted in an aperture of said sprocket portion; said pin including a first free end so configured and sized as to contact said pushing surface and a second end so configured and sized as to cooperate with a biasing element and with said stopping elements; said pin being slidable in said aperture between a fully extended position where said second end cooperates with said stopping elements to maintain said sprocket portion in a desired position and a fully retracted position where said sprocket portion is free to radially move within said track element; said biasing element including a compression spring biasing said pin towards said fully extended position.

12. A variable diameter sprocket as recited in claim 11, wherein said aperture includes a peripheral projection so configured and sized as to

selectively contact said guiding surface of said movable portion of said sprocket diameter changing mechanism, thereby preventing contact between said pin and said shoulder portion.

13. A variable diameter sprocket as recited in claim 9, wherein said pushing surface includes four angled ramp portions generally defining an X-shaped pattern and wherein said throat is generally located in the intersection of said four ramp portions.

14. A variable diameter sprocket as recited in claim 13, wherein each of said four ramp portions includes a shoulder defining said guiding portion.

15. A variable diameter sprocket comprising:

a support having a rotation axis and at five slotted and radial track elements each provided with six frusto-conical indentations;

five sprocket portions each being so mounted to a respective one of said five radial track elements of said support as to be radially movable therein; each of said sprocket portions includes a pin so slidably mounted in a aperture of said sprocket portion as to interconnect with said six stopping elements to selectively maintain the sprocket portion in a desired radial position; each sprocket portion also includes a biasing element mounted thereto to bias said slidable pin towards said six stopping elements; said pin including a first free end and a second end configured and sized to selectively interconnect with said six frusto-conical indentations; each said sprocket portion also including a peripheral projection surrounding said aperture;

a sprocket diameter changing mechanism including a fixed portion and a movable portion mounted to said fixed portion; said movable portion including a pushing surface so positioned and configured as to overcome a biasing action of said biasing element through a pushing action on said free end of said slidable pin; said pushing action causing the disengagement of said second end of said pin from one of said six stopping elements; said movable portion including at least one guiding surface configured and sized to contact said peripheral projection to reposition said sprocket portion in a second desired radial position; said movable

portion also including a throat so configured, positioned and sized as to cease the pushing action of the pushing surface when said sprocket portion has reached said second desired radial position so as to engage said second end of said pin with a stopping element corresponding to the second desired radial position.